
**Regional low-pressure metamorphism of the Meguma
Group, Pubnico area, southwestern Nova Scotia**

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Southwestern Nova Scotia lies in the Meguma terrane, the most outboard terrane of the northern Appalachians. A large area of the terrane was affected by low-pressure metamorphism (< 4 kbar) during the Devonian Acadian orogeny. It was also intruded by many post-tectonic plutons, including the Barrington Passage Pluton, a foliated biotite-tonalite. The nature of metamorphism (low-pressure regional or contact)

affecting the host rocks of the Barrington Passage Pluton has remained unresolved. The Meguma terrane is situated to the south of the Cobequid-Chedabucto Fault Zone, and underlies much of southern Nova Scotia. The major component of the Meguma terrane is the Meguma Group, a 6–10 km thick sequence of metamorphosed Cambrian-Ordovician turbidites. The Meguma Group is divided into two formations: the Goldenville Formation and the conformably overlying Halifax Formation. The Goldenville Formation is psammitic with minor slate; the Halifax Formation is primarily slate with minor psammitic interbeds. Both units are found within the study area. The entire Meguma terrane was deformed and metamorphosed during the Acadian orogeny. Deformation resulted in the formation of regional-scale, upright, shallowly-plunging folds displaying axial planar foliations. The trend and strike of these features is northeast to north in southwestern Nova Scotia. Most of the terrane experienced low-grade (chlorite-grade, sub-greenschist- to greenschist-facies) regional metamorphism, but some areas attained a higher grade (sillimanite-grade, amphibolite-facies) of metamorphism. These regions include the Canso area and southwestern Nova Scotia. Abundant plutons occur in both of these areas. Previous work has focused on the timing of regional metamorphism in the Meguma terrane. This is somewhat complicated in southwestern Nova Scotia by thermal overprinting resulting from the Devonian South Mountain Batholith and related granitoid plutons (ca. 372 Ma), as well as Late Carboniferous to Early Permian plutonism (320–300 Ma; ca. 290 Ma).

The amphibolite-facies metamorphism encountered in some parts of the Meguma terrane was initially assigned to a contact event arising from the intrusion of the post-tectonic South Mountain Batholith and related plutons. It has since been proposed, however, that the higher-grade metamorphism was, in fact, a regional metamorphic event related to emplacement of the Devonian plutons. The most recent available age data suggests an age of 406–388 Ma for the greenschist-facies metamorphism and 373 Ma for the amphibolite-facies metamorphism. These dates were based on $^{40}\text{Ar}/^{39}\text{Ar}$ data from muscovite and hornblende separates and Meguma Group whole rock samples (slate and metasiltstone), field relationships and the U-Pb age of ca. 373 Ma for the Barrington Passage Pluton. Based on petrographic analysis of representative thin sections from the study area, as well as microprobe data and geothermobarometric studies, it would appear that the host rocks of the Barrington Passage Pluton were metamorphosed during a regional, low-pressure (2–4 kbar) event. Temperatures reached 500–600°C during this event, suggesting the intrusion of the Barrington Passage Pluton was a major contributor to the heat flow required to reach the sillimanite-grade metamorphism attained by Meguma Group rocks within the study area.